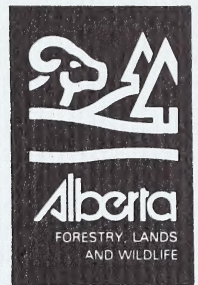


NATURAL AREAS NEWSLETTER



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Editor's Message

As the leaves change colour and the birds begin their migration to warmer climates, it is with regret that the field season draws to a close. Staff of the Natural Areas Program were involved in numerous summer trips, two which are mentioned in this issue (Clearwater River Birding Expedition and the Bow River Canoe Trip).

Of special note in this newsletter is the article on the Ecosystem Management Conference in Syracuse, New York by Lorna Allen. From conferences such as this, we can gain valuable insight into developing strategies for resolving environmental issues. We will be obtaining the proceedings of the conference and in following editions will list topic headings.

In closing, congratulations go to The Honourable Don Sparrow, Alberta's Minister of Tourism who has been honored by a prestigious national award from the Canadian Council on Ecological Areas for his conservation achievements during Wildlife '87, when he was Minister of Forestry, Lands and Wildlife.

Sandra Myers

Sandra Myers
Volunteer Steward Co-ordinator

Yellow Lady's-Slipper Transplant

With its large, golden-yellow pouch, the yellow lady's-slipper is the showiest of Alberta's native orchids. Although it is also one of our most common orchids, it requires a specialized habitat and has a slow rate of reproduction, so concern for its future is justified. The Red Deer River Naturalists have shown such concern.

In the ditch along a stretch of Highway 2A between Olds and Bowden is a population of yellow lady's-slipper estimated at about 5000 plants. Here they have found the required moist, open habitat to thrive. But plans to widen the highway threaten the population. Because the plants are growing in the ditch along the highway, the only options were to allow the population to be destroyed or to attempt to move as many of the plants as possible.

Mike McNaughton, who is both a member of the Red Deer River Naturalists and one of our volunteer stewards organized an orchid transplant. He located a suitable habitat to move them to; an area in the Gaetz Lake Sanctuary in the city of Red Deer. Yellow lady's-slipper once grew there but were eliminated, probably because of people picking them. With the help of the Alberta Native Plant Council, a work bee was organized and about 500 plants moved. How successful the move will be remains to be seen. With the co-operation of Alberta Transportation, another, larger effort to move more plants will likely be made in the spring. Contact either the Red Deer River Naturalists or the Natural Areas Program for additional details.

Volunteer Stewards Concerned With Proposed Road Development

The Wagner Natural Area Society, volunteer stewards for the Wagner Natural Area, is very concerned with a proposal by Alberta Transportation and Utilities and the County of Parkland to develop an interchange and southward extension of Villeneuve Road along the east side of the Natural Area. According to the proponents, the purpose of this development is to provide access to Highway 16X for local residents and businesses and to encourage industrial development on lands south of the Natural Area.

The Society believes that the proposed road development will have serious direct and indirect negative impacts on the area as it would directly destroy populations of orchids and bisect a large environmentally significant area and associated marl pond. They also have serious concerns with the road possibly disrupting the peatland's groundwater supplies thereby threatening the integrity of the entire area.

The volunteer stewards, Alberta Transportation, County of Parkland, Alberta Forestry, Lands & Wildlife and other agencies are working on resolving the issue.

Clearwater River Birding Expedition

With a loud roar of the float plane's engine we were off! It was June 21 and after months of planning and last minute setbacks we were actually leaving Fort McMurray. We flew up the Clearwater River to the bottom of Whitemud Falls near the Saskatchewan border. There we set up camp for five days as we inventoried birds in the Whitemud Falls Ecological Reserve and in the 10 km grid surrounding it. From there we canoed about 115 river kilometers back down the Clearwater to Fort McMurray, inventorying and noting casual bird observations as we went.



Planning for the trip began in the spring when Jack Clements, Director of the Alberta Breeding Bird Atlas contacted the Natural Areas Program to see if there was a remote area that needed inventorying. Jack had four American volunteers who were interested in helping out with the Bird Atlas. They settled on the Whitemud Falls Ecological Reserve, a spectacular area in Alberta with unique bedrock stacks, 30 metre high falls, gorges, rapids, caves and rare and disjunct plants.

The Bird Atlas is a five year Alberta-wide inventory of breeding birds to discover and map out their densities and distributions. It is being done entirely by volunteers and Jack solicited assistance from the Alberta Government for this trip. The Alberta Forest Service (AFS) supplied two of the canoes, some equipment and two Beaver float planes to get us into the area. Natural Areas supplied transportation to and from Fort McMurray, a canoe, the guide (me), and lodging. The Bird Atlas did a lot of work coordinating and shuttling volunteers. American volunteers Ellen Johnson and Charlie Adolewski flew from Massachusetts. Sue Drasler flew from New Jersey and Paul Reeberg drove from California. Richard Klauke, Atlas Coordinator for the St. Paul area also joined the expedition.

The Honourable Don Sparrow Minister, of Tourism, served a send-off lunch and we were welcomed back, from inventorying by Mayor Chuck Knight, Gordon Armitage, AFS, Don McGaldery, Ducks Unlimited, and Brad Arner, Regional Coordinator of the Bird Atlas.

The inventory itself was lots of fun. The country was beautiful with bedrock stacks rising out of nowhere, and open jackpine-lichen stands intermixed with aspen or mature white spruce stands or open meadows. All of this was contained within the steep 500 m valley walls surrounding the river. Ellen and I were able to see a beautiful black bear sow - she was actually red except on her back where her fur was bleached blonde by the

sun. The river was beautiful with rapids, 30 m high cliffs, bedrock stack islands, and home to trophy Northern Pike and Walleye. Sometimes the limestone was full of fossils. Many of the lower islands were surrounded with meter-high ferns. One day I saw an otter a few feet away checking me out; other days we saw moose or white-tailed deer. Another sow bear was found with her two cubs sunning themselves on the top limbs of a big old jackpine. We saw fox and weasel; some nights wolves howled around our camp. We often saw Canada toads - a range extension for the species.

Now as to birds: well, we felt keenly disappointed in numbers and species. In the falls area the only duckling we found was a Common Merganser in the belly of our pike dinner. Indeed, as the abundance of fish went down as we got closer to McMurray, brood sizes and numbers went up. We felt that this was directly related to the "slough sharks". Five Hooded Mergansers were spotted, a special bird for the area. An example of the low densities was a good-sized aspen woods that had only one Least Flycatcher singing sporadically when we went through it looking for all his pals and neighbors. On the other hand we saw good numbers and clutches of Ruffed and Spruce Grouse and spectacular Common Nighthawk displays. Common Merganser and Goldeneye, Mallard, Belted Kingfisher and Spotted Sandpiper were common on the river, as were Northern Waterthrush, Cedar Waxwing, Common Raven, Magnolia and Tennessee Warblers, and Bank, Barn, and Tree Swallows. Yellow Warblers were one of the rarer warbler species, to our surprise. While we saw Bald Eagles frequently a real surprise was an immature Golden Eagle that Richard spotted.

All in all, an enjoyable trip that yielded 99 bird species and lots of information to the Atlas, to Natural Areas and to Alberta Recreation & Parks' Ecological Reserves Program. By the way, the Atlas is still looking for volunteers to inventory squares. An ideal way we can help out is by taking a square that contains a favorite natural area and identifying the birds in the natural area if not in the whole square. Contact Jack Clements at the Provincial Museum (427-1743). Natural Areas is very interested in all your findings, too!

Happy Birding

Chel McDonald

Bow River Canoe Trip

Trevor O'Reilly and friend Chris D'Emanuele of Calgary won a fun (and water) filled day on the Bow River with Chel McDonald and Bill Richards of the Natural Areas Program. During the opening of the new Energy/Forestry, Lands and Wildlife Information Centre in Calgary, Alberta Public Lands offered a door prize of a canoe trip for two on the Bow River. On July 5 the two lucky Calgarians were picked up and escorted to the Ghost Dam 18 km west of Cochrane for the start of the trip.

The departure down river was delayed by rain, but after an introduction on river safety and paddling techniques the two canoes set off, as the sun tried to peek through the overcast sky. There was a large volume of water in the river making it very exciting and challenging for the two novice bow paddlers.

NATURAL HISTORY NOTES

Fiery Hues Of Fall

In the fall, as if by some secret signal, the leaves of deciduous trees begin to change color, from their customary lush green to a riot of fiery hues. What causes these variations?

Among the most important environmental factors controlling autumn coloration are temperature, light, and water supply. The lowering of the temperature below the freezing point favors anthocyanin (red and violet pigment) formation. However, severe early frosts actually make red autumn colors less brilliant. Drought favors red colors as does bright light. Anthocyanins usually develop only in leaves that are exposed to the light. In summary, the best autumn colors occur under conditions of clear, dry and cool but not freezing weather.

The amounts and proportions of pigments in the leaves vary with species, environment and leaf age. Generally there is about three times as much chlorophyll as other pigments. This light-absorbing pigment is involved in the photosynthetic process, and incidentally it produces the dominant color of earth's land surface. Chlorophyll pigment disintegrates with use. During the growing season, it is continuously replenished. However, in the fall, two weeks without moisture, or with bright light and declining temperature somehow interfere with the pigment's synthesis. Chlorophyll development stops and the chlorophyll already present disintegrates.

As the green mantle vanishes, yellow and orange pigments called carotenoids, which have been present in the leaves all along and which are not broken down by the action of sunlight, become unmasked and visible. At the same time, sugars are accumulating in the leaves and, as they are exposed to sunlight, they are changed into bright red and violet pigments called anthocyanins. The anthocyanin synthesis will only be possible in species which contain large enough amounts of carbohydrates and the hereditary potential to transform them.

The magnificent fall display of colors in deciduous trees marks the end of food production and announces that the trees will shed their leaves soon. This abandonment of their food factories is a drastic strategy for survival dictated by environment and evolutionary adaptation. The crowns cannot support the huge burden of leaves during winter gales and the broad, thinly coated leaves of deciduous trees are far more wasteful of water than are evergreen needles. The ground is frozen in winter and roots can no longer draw in water. Without replacement for the water lost through transpiration in the leaves, the trees would quickly dry up and die.

Instead the leaves die. The cool weather slows the sap movement that carries synthesized sugars from the leaves. A band of cells called the abscission layer forms at the base of each stem, where the leaf is attached to the twig, in preparation for sealing off the tree's supply of water for the winter. Beneath this layer, another one forms, like scar tissue, to cover the wound when the leaf falls, and this growth stops up the pipelines of the tree so

that no more moisture goes into the leaf for a period of about two weeks.

As the leaves die they paint the forests with a vivid palette of colors: clear-yellow for yellow poplar, brilliant yellow and orange for the pin cherry, and purple for choke cherry and red osier dogwood. Trees and shrubs of the same species growing together often show much difference in color because of individual variation in amounts of soluble carbohydrates. Some reach their peak later than others.

Nature's cycle continues. The trees burst into glorious colors before lapsing into the naked dormancy necessary for winter survival. As the autumn winds tear the last leaves from the trees, sending them whirling in spirals around the trunks, and as the frost picks the last of the fruits, only the dark greens of the evergreens remain to relieve the greys, whites and browns of winter.

Hibernation: Sleeping The Cold Days Away

Most animals remain active from their dens and burrows throughout winter but others prefer to avoid the difficult conditions of winter and spend the cold months curled up somewhere, sleeping the winter away. This last behavior is called hibernation. It can be described as a series of physiological changes that enables animals to survive through the tough times by passing the winter in a torpid or lethargic state.

Some hibernators, among them bears, squirrels, raccoons and skunks, lapse into conditions of prolonged dormancy, in which their body temperature declines markedly, but usually not below 15° C. Their sleep, is broken by periods of wakefulness. On such occasions, they may leave their dens for brief sojourns outside. This is known as torpor.

Others, such as the marmot, undergo extraordinary physiological changes. The hibernator that was active and alert on the previous day is now cold to the touch, and either motionless or capable only of slow, uncoordinated movements. During hibernation, the body temperature drops to near freezing point; the heart, normally functioning at the rate of up to 400 beats per minute, is slowed to five beats. In this condition, body functions are so diminished that the animals have all the observable characteristics of death. This deep sleep may last for 6 months or more and is called deep hibernation. To make sure it has a sufficient supply of energy to stay alive during all those months, the animal must either store food in its nest or burrow, like the squirrel does, or accumulate a considerable body fat reserve before entering hibernation.

Bats hang by their hind feet when sleeping and their wings and tail membrane may be curled close to the body for added insulation. Many species of bats huddle together when hibernating in caves and other secluded dark places.

With the exception of bats, all hibernators curl in a ball when in hibernation. The head is tucked under the

abdomen, and the back is usually exposed above the nest. The insulative properties of the nests plus their curled position may protect the animal from sudden changes in air temperature.

The popular view of hibernation as an animal sinking into a deep sleep at the approach of winter, not to wake again until spring, is not found in nature. All species of hibernators studied exhibit a behavior of arousing periodically. They spontaneously regain a high body temperature, then resume deep hibernation. The frequency of arousal and the length of the warm-blooded and active state vary widely with species and among individuals.

The physiological state of hibernation requires unique adaptations, especially in deep hibernators. Survival of extreme low body temperature and ability to rewarm from that low temperature are required and it demands special adaptations of the metabolism of cells. The tissues of the deeply hibernating mammal must be able to function adequately at both of the two temperatures at which it regulates. The separation between these two may be as much as 35° C.

Reptiles do not hibernate but they do undergo a decline in body temperature when exposed to a cold environment, and will enter into a state of hypothermia from which they cannot arouse until there is an increase in air temperature. Their main protection against lethal freezing in winter depends on choosing a suitably protected spot before being overcome by hypothermia, and the animal that makes the wrong choice will probably pay with its life.

Various degrees of torpor have been observed in birds, principally in hummingbirds. Torpor usually lasts for less than 12 hours and at the end of this period, the bird rewarms itself using internally generated heat.

Some rodents like the chipmunk, for example, spend most of their time in hibernation, starting in November. Compared to other hibernators like bats and marmots, the chipmunk's sleep is fitful. Its body temperature

doesn't drop very low, only to 10° C, and every four days it rouses itself for several hours, bringing its body temperature back up to normal. Chipmunks store very little body fat for the winter; instead they use their wakeful periods to nibble away at their provisions, hidden directly beneath them. On unusually warm days, they may even go out. When they return to their burrows, they replug the entrance with earth, a behavioral characteristic of all chipmunks and settle for another sleep in their cozy little hide-away.

As for the woodchuck, which is a deep hibernator, in late summer or early fall, it puts on a heavy layer of fat, around 40% of its body weight. It digs a winter burrow where it resides alone or occasionally with a single companion. In early October, it barricades itself into the hibernation chamber, packing the soil behind it. Then the woodchuck rolls into a tight ball and enters a deep sleep. Body temperature and pulse rate lower and breathing slows to once every 6 minutes. Its stored fat will last until breakfast, more than 6 months later. When it emerges, it relies on its remaining fat reserves for several weeks, until new greenery appears.

Bears and raccoons may be dormant through excessively cold weather, but are definitely not deep hibernators. Metabolic rate and body temperature drop only to about 32° C. They consume no food or water during hibernation, subsisting entirely on their bodily reserves. Stored fat is the principal energy source in cold weather; weight loss over winter may be as high as 50%. They remain responsive to touch and to changes in the weather.

Winter and early spring are the times when food is most scarce and the demand for it the greatest. Many species of birds avoid this problem by migrating in the autumn to a warmer climate where food is abundant. For an animal that can fly, migration is a possibility, but for a terrestrial mammal it is out of the question. It must stay in the unfavorable environment. The animal will have no choice: find enough food to carry it through the winter, hibernate to survive or die in the attempt.





By noon, the party reached the coniferous-covered Wildcat Island Natural Area. The sun still had not made it through the heavy cloud cover and lunch was eaten

under a tent fly, in the shelter of a large white spruce. This beautiful island is home to mule deer, red squirrel and a number of other small mammals. It is visited regularly by people rafting and canoeing the Bow River.

As well, the river's steep rock cliffs and clay banks, adjacent to the Natural Area, provide residence to numerous bank and cliff swallows that are continuously performing aerial acrobatics. In total 38 species of birds were noted, including a very wet Bald Eagle, an Osprey, several Red-tailed Hawks and Prairie Falcons.

The trip ended at Highway 22 in Cochrane, just down stream of the bridge where Greg McAndrews (Public Lands Agrologist from Calgary) had shuttled our van.

As well as the successful canoe trip down the Bow River, Trevor and Chris were presented with Public Lands buttons and pins as mementos of the day.

Steward Profile: Robin Lawless

Robin Lawless is a News Photographer for CFCN T.V. Calgary who has a keen interest in the outdoors and in wilderness photography. Robin was one of the first individual volunteer stewards and looks after four Natural Areas, more than any other person. The sites, all west of Calgary are: #450 Moose Mountain, #250 Pigeon Mountain, #408 Canmore Highway, and #448 Mount Lorette.

QUESTION (Q): *What prompted you to become a volunteer steward?*

ROBIN: I became aware of the Volunteer Steward Program through news releases. I was already familiar with these sites and was interested in environmental matters. I believe it is vital to educate the public about the importance of protecting areas such as these. Becoming a volunteer steward is a way for me to become actively involved in assisting with the protection of sites and also to educate the public about the value of conservation - not just for Alberta, but for the world in general. Being a volunteer steward is a worthwhile experience; without a doubt!

Q: *With all your responsibilities at CFCN TV how do you find time to be the steward for four sites?*

ROBIN: As I spend much of my free time as possible in the outdoors I find that the added responsibilities of being a steward are quite enjoyable and not at all burdensome. Initially the most time involved in managing these sites is in spending a day on each area to find the boundaries. My four sites are in the forested area where there are few or no manmade features to delineate the boundary, unlike the settled portion of the province where it is quite easy to determine the perimeter.

Q: *What interested you in these particular sites?*

ROBIN: I had a preference for areas where I had taken photographs and that I was familiar with. The four sites are quite different with a variety of natural features and management issues. Moose Mountain has been set aside for conservation reasons, Pigeon Mountain and Mount Lorette for recreation and education, and Canmore Highway for education. I was

particularly interested in Mount Lorette as it is situated next to Mount Allen and very picturesque: from beaver to moose and marsh to mountain slopes. I was concerned with potential impacts from Olympic-related events at Nakiska.

Q: *Are there any suggestions you would like to make that might help other volunteer stewards in managing their own sites?*

ROBIN: It is important that stewards use all available resources to find out as much as possible about their site. In my case I have found that Park Wardens are my best asset. They have been most helpful in identifying animals and plants and in supplying general information. The most important thing a volunteer steward must do is keep aware of his area.

Q: *Having been involved with the program for almost a year what is your opinion of the Volunteer Steward Program?*

ROBIN: I believe it is an excellent program and very worthwhile. I would however like to receive more specific details on how to write out a basic inspection report. Furthermore, I feel more signs are necessary to make the public more aware of the program. For example, signs stating: "Natural Areas - Supervised by Volunteer Steward(s)". For the most part, the public is not even aware that areas are designated Natural Areas.

Q: *Do you find the Newsletter informative and useful?*

ROBIN: I am very pleased with the Newsletter. I feel it is a great addition to the program. I especially enjoy the detailed information about habitats, plants and animals. It makes the program more interesting and educational.

Thank you Robin for your time. Your involvement as a volunteer steward is surely an inspiration to others who are interested in becoming a part of this program. We hope your involvement continues to be as interesting and rewarding as you have found it so far.

Burning and Weed Control on Natural Areas – Wave of the Future?

by Lorna Allen, Natural Areas Biologist

In June of 1988, a conference on ecosystem management, concentrating on rare species and significant habitats, was held by the Natural Areas Association. With over 140 presentations and over 500 registrants, it was a large and informative conference. At most times, four sessions were held at once - making it difficult to choose which to attend. This year for the first time, a proceedings will be published and many of the papers will be of direct interest as they touch on many of the aspects of management that we deal with at Natural Areas.

The papers varied from the general, thought-provoking type that discuss philosophy of management to the very detailed "how to" kind of presentation on topics like the methods of preventing erosion on side-hill slopes. One session that comes to mind was a presentation on the importance of disturbance (in this case caused by deer) in preventing shrub encroachment of marl ponds. The ponds looked a lot like those at Wagner Natural Area, so some of the information in the paper may prove very useful in the long-term protection of that site's important features.

I gave a paper summarizing the various activities on Alberta's rare and endangered plant species that the Natural Areas Program has been involved in over the past few years. Since I gave the paper in the main auditorium with over a hundred people in attendance, it was a bit scary, but the talk was well-received. Of the comments that people made after my presentation, one stands out. This person said that the most striking thing about the slides I used to illustrate my talk was that there were no people, fences or buildings in the landscapes!

These conferences remind us of how lucky we in Alberta are with our rich and diverse natural landscapes. The lists of rare and endangered species for Florida are published in a six volume series! In some areas of the United States, particularly those in the "corn belt", such as Illinois, only small, scattered parcels of natural habitats remain. Some types of communities, such as tall-grass prairie have almost been completely lost.

The grasses and herbs in a tall-grass prairie averaged ten feet tall – so tall that a person on horseback could only just see above it. I find it hard to understand how no one noticed that they were losing a habitat which is so distinctive. Yet today small sites of only a few acres in size are the largest remaining stands of a community that once stretched throughout the midwest, covering millions of acres.

While here in Alberta, we are still in the "protection" phase of identifying and setting aside important resources, in the States they seem to be increasingly moving into the "management" phase. Pressures of use, invasion of weedy species (which may be animal species as well as plant species) and even natural successional patterns change the character of sites. In many cases, they have found that active management is required or the features for which the site was originally set aside may be lost.

Burning of prairies is commonly done for management reasons. The native grassland plants are adapted to burning but the majority of invading weed species are not. Teasel, burdock and even day-lilies will take over the grasslands, out-competing the native species unless they are actively managed. One species, black locust, is so invasive and so difficult to eradicate that in some cases they have resorted to using herbicides to keep it under control.

In our northern climate, the species that can survive and out-compete native species are comparatively few. I find it hard to imagine having a problem with day-lily infestations! But invasion by non-native species is a major problem in many of the protected areas in the United States, and we should begin monitoring our protected areas now to ensure that this does not become a major problem here.

There is a wide range of programs and types of protected areas in the States, just as there is in Canada. Generally because of the greater population in the United States and because they have been at the game of exploitation and of protection longer, there are many lessons to be learned from their experiences.

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